

Docket No. 520.42565CX1
Serial No.10/812,974
Office Action dated December 1, 2006

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

LISTING OF CLAIMS:

Claims 1 - 38 (canceled)

39. (currently amended) A plasma processing method comprising the steps of:

locating a specimen on a specimen table provided inside of a processing chamber, wherein the specimen table comprises a central channel disposed in a central portion of a heat conductive block of the specimen table, an outer circumferential channel in an outer circumferential portion of the heat conductive block and a ring-like part suppressing a heat conduction between the central portion and the outer circumferential portion thereof disposed between the central channel and the outer circumferential channel inside the heat conductive block;

supplying a processing gas during evacuation of the inside of the processing chamber from a lower portion thereof;

generating plasma inside of the processing chamber to process a plurality of films stacked on the specimen;

~~circulating cooling mediums-coolant inside each of the central channel and the circumferential channel, a central passage disposed in a central portion of a heat conductive member of a specimen table and a circumferential passage in a circumferential portion of the heat conductive member, a~~ the temperature of the cooling-medium-coolant in the central passage-channel being adjusted to be higher than a temperature of the cooling-medium-coolant in the circumferential channel passage so as to provide a predetermined temperature difference therebetween;

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supplying heat conductive gases to spaces between a rear surface of the specimen and a dielectric film comprising an upper surface of the specimen table, the spaces being constituted by independent spaces of a central space and an outer circumferential space including a central part and a circumferential part separated by a ring-like protrusion which is disposed on the dielectric film upper surface of the specimen table and at a position above the ring-like part inside of the heat conductive block and between the central part and the circumferential part of the specimen table which contacts with the rear surface of the specimen, and adjusting a pressure of the heat conductive gas at in the central space part of the spaces to be higher than a pressure that of the heat conductive gas in the outer circumferential space at a predetermined value of a pressure difference at the circumferential part of the space so as to provide a predetermined value of pressure difference therebetween; and

after processing an upper film of the plurality of films on the specimen while maintaining the temperatures of the coolant mediums and the pressures of the heat conductive gases, changing the value of the pressures of the heat conductive gases In the central space and the outer circumferential space, part and the circumferential part of the spaces while maintaining while the temperatures of the cooling mediums coolant is maintained, and processing a lower film of the plurality of films on the specimen.

40. (currently amended) A plasma processing method according to claim 39, wherein the pressures of heat conductive gases in the central part space and the outer circumferential space part of the spaces are adjusted on the basis of information obtained before processing of the specimen.

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41. (currently amended) A plasma processing method according to claim 40, wherein based on the information obtained, determining when the lower film should be processed with a temperature difference ~~on~~of the specimen which is larger than ~~a temperature difference which~~ can be formed by a maximum pressure difference between the central ~~part~~space and the outer circumferential space ~~part of the spaces~~, and changing the temperatures of the central portion and the circumferential portion of the heat conductive ~~member~~block, while changing the pressures of the heat conductive gases in the central ~~part~~space and the outer circumferential space ~~part of the spaces~~.

42. (currently amended) A plasma processing method according to claim 39, wherein after processing the upper film of the plurality of films on the specimen while maintaining the temperatures of the heat conductive ~~member~~block and the pressures of the heat conductive gases, changing the value of the pressure difference between the central ~~part~~space and the outer circumferential space ~~part of the spaces~~ so that the pressure of the heat conductive gas in the outer circumferential partspace is higher than ~~that the pressure in the central space part of the spaces~~ while maintaining the temperatures of the portions of the heat conductive blocks ~~central and circumferential portions of the heat conductive member~~, and processing the lower film of the plurality of films on the specimen, the pressures of the heat conductive gases in the central space and the outer circumferential space being adjusted on the basis of information obtained before processing of the specimen.

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43. (currently amended) A plasma processing method according to claim 42, wherein the pressures of heat conductive gases in the central part space and the outer circumferential part of the spaces space are adjusted on the basis of information obtained before processing of the specimen.

44. (currently amended) A plasma processing method according to claim 43, wherein based on the information obtained, determining when the lower film should be processed with a temperature difference ~~on~~of the specimen which is larger than ~~a temperature difference which can~~ be formed by a maximum pressure difference between the central part space and the outer circumferential space part of the spaces, and changing the temperatures of the central portion and the circumferential portion of the heat conductive ~~member block~~, while changing the pressures of the heat conductive gases in the central part space and the outer circumferential space part of the spaces.

45. (currently amended) A plasma processing method comprising the steps of:
locating a specimen on a specimen table provided inside of a processing chamber, wherein the specimen table comprises a central channel disposed in a central portion of a heat conductive block of the specimen table, an outer circumferential channel in an outer circumferential portion of the heat conductive block and a ring-like part suppressing a heat conduction between the central portion and the outer circumferential portion thereof disposed between the central channel and the outer circumferential channel inside the heat conductive block;
supplying a processing gas during evacuation of the inside of the processing chamber from a lower portion thereof;

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generating plasma inside of the processing chamber to process a plurality of films stacked on the specimen;

~~adjusting a temperature of a central portion of a heat conductive member of the specimen to be higher than a temperature of a circumferential portion of the heat conductive member of the specimen so as to provide a predetermined temperature difference therebetween;~~

circulating coolant inside each of the central channel and the outer circumferential channel, the temperature of the coolant in the central channel being adjusted higher than a predetermined temperature difference than that of the coolant in the circumferential channel;

supplying heat conductive gases to spaces between a rear surface of the specimen and a dielectric film comprising an upper surface of the specimen table, the spaces constituting independent spaces of a central space and an outer circumferential space including a central part and a circumferential part separated by a ring-like protrusion which is disposed on the dielectric film at a position above the ring-like part inside of the heat conductive block and upper surface of the specimen table and at a position between the central part and the circumferential part of the specimen table which contacts with the rear surface of the specimen, and adjusting a pressure of the heat conductive gas at in the central space part of the spaces to be higher than that a pressure of the heat conductive gas at a in the outer circumferential space at part of the spaces so as to provide a predetermined value of a pressure difference therebetween; and

after processing an upper film of the plurality of films on the specimen while maintaining the temperatures of the heat conductive member block and the pressures of the heat conductive gases, changing the pressures of the heat

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conductive gases in the central ~~part-space~~ and the outer circumferential space, ~~part of the spaces~~ while maintaining the temperatures of the portions of the heat conductive ~~member~~, block is maintained and processing a lower film of the plurality of films on the specimen.

46. (currently amended) A plasma processing method according to claim 45, wherein the pressures of heat conductive gases in the central ~~part-space~~ and the outer circumferential space ~~part of the spaces~~ are adjusted on the basis of information obtained before processing of the specimen.

47. (currently amended) A plasma processing method according to claim 46, wherein based on the information obtained, determining when the lower film should be processed with a temperature difference ~~on of~~ the specimen which is larger than ~~a temperature difference which can~~ be formed by a maximum pressure difference between the central ~~part-space~~ and the outer circumferential space ~~part of the spaces~~, and changing the temperatures of the central portion and the circumferential portion of the heat conductive ~~member-block~~, while changing the pressures of the heat conductive gases in the central ~~part-space~~ and the outer circumferential space ~~part of the spaces~~.

48. (currently amended) A plasma processing method according to claim 45, wherein after processing the upper film of the plurality of films on the specimen while maintaining the temperatures of the heat conductive ~~member-block~~ and the pressures of the heat conductive gases, changing the value of the pressure difference between the central ~~part-space~~ and the outer circumferential space ~~part of~~

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~~the spaces~~ so that the pressure of the heat conductive gas in the outer circumferential space part is higher than ~~that the pressure in the central part space of the spaces~~ while maintaining the temperatures of the portions of the heat conductive ~~member block~~, and processing the lower film of the plurality of films on the specimen, the pressures of the heat conductive gases in the central space and the outer circumferential space are adjusted on the basis of information obtained before processing of the specimen.

49. (currently amended) A plasma processing method according to claim 48, wherein the pressures of heat conductive gases in the central part space and the outer circumferential space part ~~of the spaces~~ are adjusted on the basis of information obtained before processing of the specimen.

50. (currently amended) A plasma processing method according to claim 49, wherein based on the information obtained, determining when the lower film should be processed with a temperature difference ~~on~~ of the specimen which is larger than ~~a temperature difference which can be formed by a maximum pressure difference between the central part space and the outer circumferential space, part of the spaces, and changing the temperatures of the central portion and the circumferential portion of the heat conductive member block, while changing the pressures of the heat conductive gases in the central part space and the outer circumferential part of the spaces.~~